

CLAIMS

What is claimed is:

1. A refrigerant cycle:

a compressor;

said compressor having an outlet providing a refrigerant to a condenser, said condenser providing refrigerant to a main expansion device, refrigerant moving from said main expansion device to an evaporator, and a compressor suction inlet downstream of said evaporator;

at least one economizer injection port communicating with said compressor at a location downstream of said suction inlet; and

an unloader valve for selectively communicating a compressed refrigerant from said compressor through said economizer injection port to a point upstream of said evaporator.

2. A refrigerant cycle as recited in claim 1, wherein said compressor is a scroll compressor.

3. A refrigerant cycle as recited in claim 1, wherein said unloader valve is positioned in a bypass passage mounted outwardly of a compressor housing.

4. A refrigerant cycle as recited in claim 1, wherein a sensor is positioned downstream of said evaporator, and upstream of said suction inlet to said compressor, said sensor controlling said main expansion device to achieve a desired amount of superheat at an outlet of said evaporator.

5. A refrigerant cycle as recited in claim 1, wherein an economizer circuit supplies refrigerant to said economizer injection port, and an economizer valve disposed upstream of a point where said unloader valve communicates with said economizer injection port, said economizer valve being shut when said unloader valve is opened.

6. A refrigerant cycle comprising:

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a scroll compressor pump unit having an orbiting scroll with a base and a scroll wrap extending from said base, a non-orbiting scroll having a base and a scroll wrap extending from said base and interfitting with said orbiting scroll wrap to define compression chambers;

at least one economizer injection port passing into said compression chambers, said economizer injection port communicating with an economizer injection passage, which is connected to an economizer circuit;

said compressor pump unit having an outlet providing a refrigerant to a condenser, said condenser providing refrigerant to a main expansion device, and said refrigerant moving from said main expansion device to an evaporator, and a suction inlet being provided back to said compressor downstream of said evaporator; and

an unloader system selectively communicating said economizer injection passage to a point upstream of said evaporator, said unloader system including a bypass line communicating said economizer injection passage to said point upstream of said evaporator and an unloader valve selectively opening said bypass line, compressed refrigerant from said compression chambers passing through said economizer injection passage and to said point upstream of said evaporator when said unloader valve is open.

7. A refrigerant cycle as recited in claim 6, wherein an economizer valve is placed on said economizer injection passage, upstream of said bypass line.

8. A refrigerant cycle as recited in claim 7, wherein said economizer valve is shut when said unloader valve is open.

9. A refrigerant cycle as recited in claim 6, wherein said economizer valve is positioned in a bypass passage mounted outwardly of a compressor housing.
10. A refrigerant cycle as recited in claim 6, wherein a sensor is positioned downstream of said evaporator, and upstream of said suction inlet to said compressor, said sensor controlling said main expansion device to achieve a desired amount of superheat on an outlet of said evaporator.